EXHIBIT C

UNITED STATES DISTRICT COURT
SOUTHERN DISTRICT OF WEST VIRGINIA
CHARLESTON DIVISION

IN RE: ETHICON, INC., PELVIC REPAIR SYSTEM PRODUCTS LIABILITY LITIGATION	**Master File No. 2:12-MD-02327** **MDL 2327** **JOSEPH R. GOODWIN** **U.S. DISTRICT JUDGE**
THIS DOCUMENT RELATES TO: ***Pamela Bailey v Ethicon, Inc., et al*** ***Case No. 2:12-cv-01700***	

CASE SPECIFIC EXPERT REPORT OF JOYE K. LOWMAN, M.D., MPH

CASE-SPECIFIC EXPERT REPORT OF JOYE K. LOWMAN, M.D., MPH IN BAILEY V. ETHICON

I. BACKGROUND, TRAINING AND EXPERIENCE

I am board-certified in Obstetrics and Gynecology, with a subspecialty board certification in Female Pelvic Medicine and Reconstructive Surgery. I received my medical degree from the University of Pennsylvania and my masters in public health from Columbia University. I completed residency in Obstetrics and Gynecology at Abington Memorial Hospital and a subsequent 3 year accredited fellowship in Female Pelvic Medicine and Reconstructive Surgery at Indiana University, the first accredited program in the country and one of the best surgical training programs in the country. I am a graduate of the CITE (Clinical Investigator Training Enhancement) program at Indiana University, a program sponsored by the National Institute of Health to increase and improve the numbers of clinician scientists in medicine nationwide. I have over 24 years of experience in clinical and basic science research. I have received extensive training in female pelvic medicine and reconstructive surgery, including vaginal, abdominal, laparoscopic and robotic approaches to pelvic organ prolapse repair and urinary incontinence. This training included advanced surgery using mesh and graft augmentation and surgery for complex female pelvic floor disorders including urinary and bowel fistula, urethral diverticula, recurrent prolapse surgery and surgery for mesh and prolapse surgery complications. I started the Urogynecology department for the Southeast Permanente Medical Group of Kaiser Permanente Georgia in 2008, servicing over 250,000 members. I have served as Lead of the department since, where the focus of my practice and our department has been the comprehensive evaluation and management of female pelvic floor dysfunction.

I have considerable experience with surgical procedures to treat pelvic organ prolapse and stress urinary incontinence having performed well over 2800 procedures. I have performed native

tissue repairs, abdominal sacrocolpopexies (including open abdominal, traditional laparoscopic and robotic sacrocolpopexies), approximately 150 surgeries utilizing the Prolift device, and have used other manufacturers' products for treatment of pelvic organ prolapse. I have substantial experience with the implantation of mid-urethral mesh slings, having performed over 850 mid-urethral slings from various manufacturers, with various approaches. I am very familiar with the Ethicon TVT and TVT-O devices having been fellowship trained in their use and having surgically placed them in approximately 800 procedures. I also have extensive experience in the use of synthetic mesh augmentation to treat pelvic organ prolapse and have used mesh in over 1300 procedures. Additionally, I have managed complications associated with native tissue repairs, sacralcolpopexies, and transvaginal mesh surgeries both that I and other physicians have performed.

I have been trained in the comprehensive evaluation and treatment of female pelvic floor dysfunction using various techniques. My broad exposure during fellowship training allows me to individualize therapy according to the patient's needs. I am comfortable with vaginal, laparoscopic, open abdominal and robotic approaches to pelvic organ prolapse repair and stress urinary incontinence. I am also comfortable using mesh or graft augmentation and with native tissue repair. I comfortably manage mesh complications, complex female pelvic pain, recurrent prolapse and recurrent or complex urinary incontinence.

I have trained others in performing pelvic floor procedures, including treatment for pelvic organ prolapse and stress urinary incontinence. I have conducted studies relating to pelvic reconstructive surgery and treatment as the principal investigator, and have participated in studies conducted with others. Papers detailing the results of these studies have been published in peer-reviewed journals and were recognized as outstanding research at the 28th Annual American

Urogynecologic Society national meeting in 2007 and the 34th annual scientific meeting of the Society of Gynecologic Surgeons in 2008. A copy of my curriculum vitae, which details my training, education and experience, is attached as **Exhibit "A"** to this report. A list of my publications is also set forth in my CV.

Through my training, clinical and surgical experience and my ongoing review of the literature, I am very comfortable treating female urinary stress incontinence with the Tension-free vaginal tape procedure (TVT). I am familiar with the development of the TVT, as well as the safety, effectiveness, risks and benefits of using the TVT to treat stress incontinence. In preparation for my testimony, I have reviewed some of that literature, as set out in **Exhibit "B"**. Materials that support my findings and opinions, including documents that I have reviewed, are identified either in this report or are listed in **Exhibit "B"**. These materials, in addition to my personal experience, knowledge, training, practice and education, have informed the opinions referenced above and which follow as well. My conclusions and opinions are also based on the facts presented in the depositions, the physical examinations and complaints of the patient, operative reports and medical records reviewed, as well as the educational materials routinely provided by Ethicon both for the patient and practitioner, and what is usual and customary in the practice of female pelvic medicine and reconstructive surgery using an evidence based approach. Because I have been trained to perform all contemporary procedures to treat stress urinary incontinence, I understand the pros and cons of each, the particular risks of complication for each, and how to avoid them. I also understand how best to approach resolution of complications when they do occur, because I have done it in my practice for my own patients and for patients who have been referred to me with great success. I hold all opinions set forth in this report to a reasonable degree of medical and scientific certainty.

For this case, I have been asked to provide opinions and an expert report regarding Mrs. Bailey's medical conditions and the cause of her alleged injuries, whether or not her alleged injuries were caused by a problem or intrinsic flaw in the mesh product implanted, and the adequacy of the risk information and professional education provided by Ethicon. In reaching my opinions, I have reviewed the medical records of Mrs. Bailey, as well as available deposition transcripts. I have reviewed the expert report submitted by Dr. Walmsley. I have also reviewed the IFUs, patient brochures, TVT Surgeons Resource Monograph, and various professional education material used by Ethicon related to the TVT.

II. MY OPINIONS IN THIS CASE

A. Stress Urinary Incontinence-Background

Urinary incontinence is a very common and often debilitating problem affecting about 50% of women at some point in their lives. Incontinence can result from many different abnormalities, including pelvic floor dysfunction, illnesses, or abnormalities in the lower urinary tract. Leakage of urine can occur in different settings, which is how different types of incontinence are defined. For example, stress urinary incontinence occurs with physical exertion such as coughing, sneezing, lifting, or bending. Urgency incontinence occurs when a person's bladder muscle contracts causing a sudden need to urinate and involuntary leakage. Mixed urinary incontinence is when a person has symptoms of both stress incontinence and urgency incontinence.

These conditions frequently are debilitating to women, both physically and emotionally, and can have a major impact on a woman's quality of life. Urinary incontinence can lead to problems such as urinary tract infections, pressure ulcers, and cellulitis, and can also cause tremendous social disruption resulting in someone limiting their social activities and relationships

due to fear of embarrassment. Urinary incontinence can also have an economic impact on a woman by impeding her ability to perform occupational tasks because of a need to constantly be near a bathroom. Incontinence also can have a significant effect on a woman's sexual function and desire, resulting in a woman refraining from sex because of incontinence during sex or a fear that incontinence will occur.

The causes of urgency incontinence are varied and include primarily neurologic dysfunction (sensory urgency), muscle dysfunction (motor urgency), interstitial detrusor disease (bladder fibrosis), irritant exposure (caffeine, tobacco, alcohol), or a combination of the above. It can occur in both women and men. Urgency incontinence can be successfully treated in some patients or controlled with medication; and treatments include behavior modification, prescription of anticholinergic drugs, sacral nerve stimulation and Botox injection in some cases.

Stress urinary incontinence is the most common type of urinary incontinence experienced by women. Stress urinary incontinence frequently significantly affects a woman's quality of life, and may affect her ability to participate in exercise, physical activity with family and friends, working, especially if her job involves lifting, and sexual intercourse, as these activities may trigger or cause urine leakage. Women are often self-conscious because of urine odor and spend significant amounts of money on incontinence pads. Overall, stress urinary incontinence (SUI) in women very frequently leads to a reduction in a woman's quality of life. One in three women over the age of 18 years will be affected by stress urinary incontinence at some point in her lifetime.

Stress incontinence is caused most often by a compromise or weakening of urethral support due to the relaxation of muscle, fascia, and other tissue in a woman's pelvic floor. Risk factors for developing stress incontinence include previous pelvic surgery including hysterectomy, pregnancy with vaginal delivery, increasing age, obesity, metabolic disease such as diabetes, smoking and

family history, to name a few. Any condition that causes weakening of the pelvic floor structures can cause or contribute to a woman developing stress incontinence.

B. Stress Urinary Incontinence-Treatment

The medical community's understanding of treating stress incontinence has evolved over time leading to development of varying treatments and approaches to effective treatment. Early surgical treatment of stress incontinence focused on reconstruction of support at the bladder neck. Over time, the focus shifted to supporting the mid-urethra. Unlike treating urgency incontinence, there are no medications approved in the United States for treating stress incontinence.

Non-surgical options for treating stress incontinence include use of pessaries, pelvic floor muscle training, Kegel exercises, and bulking agents. These options are inconvenient and have limited long-term efficacy and are often not preferred by women seeking a longer-term solution. Many patients who initially opt for these more conservative options ultimately elect a surgical route.

Prior to the advent of the mid-urethral sling for the treatment of SUI, women had to suffer invasive abdominal surgery, sometimes with additional surgery for harvesting their own tissues in order to surgically correct their incontinence. Urethral suspension procedures performed through the abdomen (Burch, MMK, Raz) although effective in the short term have proven to have miserable long term cure rates. (Brubaker, L. Abdominal sacrocolpopexy with Burch colposuspension to reduce urinary stress incontinence. N Engl Med 354;15: 1557-1566 (2006); Albo ME, Burch colposuspension versus fascial sling to reduce urinary stress incontinence. N Engl J Med.; 356:2143-55 (2007)). In addition, these procedures are invasive, requiring over two hours to complete, and have a higher risk of intraoperative and postoperative complications

including visceral injury, bleeding, and post-operative voiding dysfunction/prolonged catheterization.

The retropubic TVT was the first mid-urethral sling developed for the treatment of SUI. It revolutionized the treatment of stress urinary incontinence in women, transforming a formerly invasive, 2 hour procedure with mediocre long-term cure rates into a 15 minute outpatient minimally invasive procedure with excellent long term cure and minimal risk of complications. These operations are suitable for women who are having their first operation to prevent incontinence, and also women who have had unsuccessful surgery previously. There are two main ways of carrying out these operations, either by inserting a tape behind the pubic bone through the abdomen ("retropubic"), or through the groin ("transobturator"). The transobturator route is associated with a decreased risk of bladder perforation and voiding dysfunction but is less effective at treating intrinsic sphincter deficiency and has a higher incidence of groin pain.

Mid-urethral sling operations have been the most extensively researched surgical intervention in gynecology to date, and many subspecialty societies and studies refer to the TVT as a measure of the "gold standard". Cox A, Herschorn S, Lee L. Surgical management of female SUI: Is there a gold standard? Nat Rev Urol 2013;10:78-89. A recent survey indicates that these procedures are used by >99% of the membership of the American Urogynecologic Society, the premier organization dedicated to the treatment of female pelvic floor disorders (Clemons et al, 2013). Moreover, the TVT and TVT-O slings have been studied in over 100 Randomized Controlled Trials (RCTs) and hundreds of other studies. The treatment of SUI in women with mid-urethral slings, including the TVT, has been shown to be effective and have a good safety profile.

For example, the 2015 Cochrane review of mid-urethral slings to treat stress incontinence concluded:

> We identified 81 trials that had a total of 12,113 women. These trials showed that over 80% of women with stress urinary incontinence are cured, or have significant improvement in their symptoms, with either operation (transobturator or retropubic sling), for up to five years after surgery. We found this to be the case irrespective of the tapes used and the route of tape insertion...the information that is available for quality of life shows that it improves as a result of these operations, though there is no clear difference between the two procedures. The evidence that we have been able to assess indicates that the positive effects persist (for 5 years after surgery). There is moderate quality evidence that overall reported rates of tape-related complications are low, such as erosion of the tape into the vagina at about 2% for both routes of tape insertion. The reported occurrence of problems with sexual intercourse including pain was low, and leakage of urine during intercourse are improved following insertion of these tapes. Mid-urethral sling operations have been the most extensively researched surgical treatment for stress urinary incontinence (SUI) in women and have a good safety profile. Irrespective of the routes traversed, they are highly effective in the short and medium term, and accruing evidence demonstrates their effectiveness in the long term. This review illustrates their positive impact on improving the quality of life of women with SUI.

In addition, a recent systematic review (Schimpf et al, 2014) reported that mid-urethral slings resulted in lower rates of perioperative adverse events such as postoperative pain, hospital stay, blood loss, operating room time, wound infections, bowel injury, DVT, and hematomas compared to the Burch procedure. Comparing absolute complication rates between pubovaginal slings and the TVT, the TVT resulted in lower rates of operating room time, blood loss, transfusion, wound infection, retention, overactive bladder symptoms, DVT, and hospital stay, whereas pubovaginal slings had lower rates of urinary tract infection and vaginal perforation. A metaanalysis of adverse event information showed no significant difference in return to the operating room for sling erosion, but favored the mid-urethral sling for better subjective cure.

The American College of Obstetricians and Gynecologists and the American Urogynecologic Society conducted a systematic review of the medical literature and issued a Practice Bulletin making recommendations regarding the treatment of urinary incontinence in

women (American College of Obstetricians and Gynecologists. Obstet Gynecol 2015; 126:e66–81). The bulletin noted the following conclusions and recommendations were based on good and consistent (Level A) evidence:

- Initial midurethral sling surgery results in higher 1-year subjective and objective cure rates than pelvic floor physical therapy in women with stress urinary incontinence.
- Synthetic midurethral slings demonstrate efficacy that is similar to traditional suburethral fascial slings, open colposuspension, and laparoscopic colposuspension. Compared with suburethral fascial slings, fewer adverse events have been reported with synthetic midurethral slings. Voiding dysfunction is more common with open colposuspension than with synthetic midurethral slings.
- There are substantial safety and efficacy data that support the role of synthetic mesh midurethral slings as a primary surgical treatment option for stress urinary incontinence in women.

Thus, the mid-urethral sling has become the therapy of choice for the treatment of SUI with several million procedures performed worldwide.

My personal experience with surgery to correct SUI started in residency. I was taught to perform the TVT and TVT-O procedures by Dr. Vincent Lucente, the first US surgeon to perform the TVT in this country. I was impressed with how well the TVT and TVT-O procedures worked. It was not until fellowship however that I appreciated the magnitude of the improvement of the TVT family of procedures over traditional bladder neck suspension procedures. In my fellowship program, we often combined an abdominal sacral colpopexy with a Burch and paravaginal defect repair to correct large prolapse and urinary stress incontinence. We used suprapubic catheters routinely because of the high incidence of post op voiding dysfunction. Our patients did very well in terms of the durability of their prolapse repairs, but many were bothered by the prolonged catheterization and subsequent irritative voiding symptoms caused by the Burch. In addition, the Burch was much more tedious and invasive to perform when compared to mid-urethral slings. Now that I perform exclusively mid-urethral sling operations to treat SUI, mainly the TVT, I have

been able to almost completely eliminate post-operative catheterization. My patients undergo a voiding trial in the post anesthesia care unit immediately after surgery and 99% of them void well and go home without a catheter. I have only had two patients require catheterization for longer than two days, and no patient has required prolonged catheterization (>2wks). I have not had a single patient report dyspareunia, pelvic pain or mesh erosion with the TVT in over 800 cases. *See* 2012 AUA update to the SUI Guidelines (pain and sexual dysfunction were higher with the Burch and autologous sling than the midurethral sling); Schimpf (2014) (dyspareunia was rare with the retropubic (<0.001%)). Overall the data show that the rates of mesh exposure with TVT are around 1 - 2.5% and are manageable. Ford 2015 Cochrane Review: Retropubic 2.1% (21/1000), Meta-analysis of Registries (Collinet 2008; Dyrkorn 2010; Kuuva 2002; Koops 2005; Tamussino 2001; Tamussino 2007; Tincello 2011): Retropubic 1.5%; Schimpf 2014 Systematic review: Retropubic 1.4%; Novara 2008 Table 6 metaanalysis of 34 studies with >24 months follow up: TVT 1.1%. I have not seen a single case of infection or contraction, and I am not aware of any literature that describes contraction associated with TVT. *See* Ford AA, Rogerson L, Cody JD, Ogah J. Mid-urethral sling operations for stress urinary incontinence in women. Cochrane Database Syst Rev. 2015 Jul 1;7:CD006375. PMID: 26130017 (2015) (analyzing data from several registries – Collinet 2008; Dyrkorn 2010; Kuuva 2002; Koops 2005; Tamussino 2001; Tamussino 2007; Tincello 2011 – involving thousands of patients and found the infection rate for retropubic slings was 0.7%). My patients go home the same day, catheter free, resume usual activities in 48 hours and have immediate long-lasting cure. Wai CY, et al. Patient Satisfaction After Midurethral Sling Surgery for Stress Urinary Incontinence. Obstet Gynecol 2013;121:1009–16 (Patient satisfaction was assessed across numerous parameters and TVT demonstrated a high level of satisfaction in patients with respect to urine leakage, urgency to

urinate, frequency of urination, capability of physical activity, social activity, ability to engage in sexual activity, and from an emotional standpoint). The TVT is recognized as the gold-standard mid-urethral sling procedure world-wide for good reason. It is my procedure of choice when definitive therapy for SUI is desired. Despite the advent of many newer mid-urethral slings, the TVT has proven time and time again to be the most effective and well tolerated of all mid-urethral slings available to date.

The TVT is one of the most thoughtfully designed products used in reconstructive surgery in the past four decades. Its inventors spent years developing it through testing and research and incorporated what was already known about biomaterials with what was newly understood about biomechanics into its design. Dr. Ulmsten and colleagues gave a very important and well received presentation about the remarkable development of the TVT in 2014 at the IUGA/AUGS joint meeting in Washington DC. The TVT transformed the art of correcting stress incontinence in women from standard retropubic urethropexy and pubovaginal slings, associated with long operative times, lengthy hospital stays, visceral injuries, intraoperative hemorrhage and poor long term success rates, to a 10 minute outpatient procedure with excellent long term success rates and minimal risk of complications. There were many problems with the procedures we performed to treat stress incontinence before the TVT was developed. The Burch procedure and other retropubic culposuspensions performed via laparotomy are invasive, take hours to perform, cause urethral obstruction and voiding dysfunction at high rates and have remarkably poor long term success rates. Pubovaginal slings were less invasive than open suspension procedures but still caused greater obstructed voiding and also had poor long term success, especially for ISD. Traditional anti-incontinence procedures are based upon older theories regarding the pathophysiology behind stress urinary incontinence. These theories focused on the pressure

transmission between the increased abdominal pressure (i.e. during a cough or sneeze) and a simultaneous reduction in in urethral closure pressure, which results in stress leakage (Einhorning 1961, DeLancey, 1994). More recent investigations on the pathophysiology of stress urinary incontinence demonstrated the importance of mid-urethral support, provided by the pubo-urethral ligaments, and the functioning elasticity of the anterior vaginal wall which effectively transmits the contractions of the pubococcygeous and levator ani muscles to effect the separate closure of the urethra and bladder neck. A series of experimental investigations led to an alternative understanding of the urethral closure mechanism in women, that required the interaction between the suburethral vaginal wall, pubourethral ligaments and pubococcygeous muscles. These discoveries became known as the "Integral Theory" (Petros 1990, 1993). The Integral theory represented a paradigm shift away from traditional views, and as such, created the opportunity for a new surgical approach to stress urinary incontinence. Dr. Ulmsten and colleagues incorporated the Integral Theory into the design of the TVT, and effectively created a procedure that replaces worn or dysfunctional pubourethral ligaments in a tension free minimally invasive way that more closely approximates normal anatomy. This engineering effectively eliminated the three most bothersome problems with traditional stress incontinence surgery: 1. long invasive procedures; 2. voiding dysfunction; and 3. poor long-term success. This was incredibly important to the fields of gynecology, urogynecology and urology as surgery is first line treatment for stress incontinence in women.

The type of mesh selected for the TVT was also thoughtfully chosen. There is a significant amount of literature discussing the evolution of biomaterials for use in hernia repair and vaginal surgery. (Amid, 1994; Amid, 1997; Falconer, 2001; AUGS SUFU 2014 Position Statement; AUGS SUFU 2014 Position Statement; Ford, 2015; Petros, 2015). The work of Dr. Francis Usher

with polypropylene in the late 1950s revolutionized abdominal hernia surgery. Type 1 polypropylene has been found to have the highest biocompatibility with the least propensity for infection. (AUGS SUFU 2014 Position Statement; AUGS SUFU 2014 Position Statement; Ford 2015 Cochrane Review). The TVT has also demonstrated long-term durability, safety and efficacy up to 17 years. (AUGS SUFU 2014 Position Statement).

The polypropylene mesh used for the TVT is macroporous with a pore size in excess of 75 μm. Macroporous polypropylene mesh easily allows macrophages, blood vessels, leukocytes, fibroblasts, and collagen to transverse the pores which promotes tissue host ingrowth with resultant biocompatibility and low risk of infection. (Amid, 1997). These advances in mesh bioengineering led to decreased mesh infection rates and better tolerability. In addition to being the gold standard for surgical treatment of stress incontinence, polypropylene mesh for ASC is now the industry standard for abdominal vault prolapse repair due to the durability and tolerability of polypropylene meshes like Gynemesh. In fact, polypropylene mesh is the industry standard for hernia repair or tissue replacement in any part of the body where tissue replacement requiring the strength of mesh is required. It is universally recognized as the most appropriate prosthetic for general surgery, cardiovascular surgery, plastic reconstructive surgery, transplant surgery, ophthalmology, otolaryngology, gynecology and urology. A study of thousands of TVT operations reported no cases of mesh rejection or intolerance. (Tamussino et al 2001).

Data cited in my report shows the macroporous Prolene polypropylene mesh tape used in the TVT to be universally accepted as the best material and most biocompatible for use in SUI. These include the highest levels of evidence such as Cochrane reviews, SUI Guidelines, systematic reviews and metaanalyses, and RCTs.

In recent years, many position statements and clinical practice guidelines from a wide group of subspecialty societies, such as the American Urogynecologic Society, American Urological Association, Society of Gynecologic Surgeons, Society of Urodynamics, Female Pelvic Medicine & Urogenital Reconstruction and the International Urogynecological Association have recognized the mid-urethral sling as the standard of care for the surgical treatment of SUI and these organizations acknowledge that it represents a great advance in the treatment of this condition in women (AUA Position Statement on the Use of Vaginal Mesh for the Surgical Treatment of Stress Urinary Incontinence Oct. 2013; IUGA Position Statement on Mid-Urethral Slings for Stress Urinary Incontinence July 2014; Schimpf et al A systematic review and meta-analysis and SGS Recommendations 2014; AUGS-SUFU Position Statement on Mesh Midurethral Slings for SUI 2014). These guidelines, analyses and position statements inform surgeons on the standard of care, the usefulness, utility, desirability of the TVT as well as its safety and do not support that TVT is unreasonably dangerous for its intended use.

Among the polypropylene multi incision mid-urethral slings, Ethicon's TVT sling has the most data and longest follow up. The size of the TVT mesh is only 1.1 cm in width and the pore size has proven to be optimal in design for long term continence cure and a low rate of complications. The risk of exposure and erosion are commonly known risks with any foreign material and there is no reliable scientific data that shows that increasing the pore size of TVT would increase efficacy or lower complications without impairing the utility of the TVT, which is demonstrated by long-term data. There is also no reliable scientific evidence that a larger pore mesh like Ultrapro or Vypro, or other meshes used for hernia repair, would work as well as the TVT. Therefore, it is my opinion that these claims are without adequate scientific support and merit.

Another claim being asserted that is not supported by the clinical data is that the Prolene mesh in the TVT is cytotoxic. However, the clinical data does not show that the mesh is cytotoxic in humans. If the mesh was cytotoxic, it would not promote tissue ingrowth and incorporation and would instead be rejected or cause necrosis or encapsulation which has not been described in 30 years worth of data. The randomized controlled trials, cohort studies and systematic reviews show excellent efficacy, safety and tolerability, which is the opposite of what one would expect to see if the mesh were cytotoxic.

I also disagree with any argument that Ethicon mesh is defective or unreasonably dangerous because it degrades. Again, the medical literature has established that polypropylene, and specifically Prolene polypropylene, is a stable and well accepted biomaterial with an extensive use for over five decades as a biologic implant. For example, the opinions expressed by sub-specialty societies such as AUGS and SUFU have dismissed these concerns by pointing out that they are not supported by extensive peer reviewed literature related to polypropylene mesh repair (AUGS-SUFU FAQs by Providers on Mid-urethral Slings for SUI March 2014). Moreover, my analysis of the data, including the numerous long term studies on TVT referenced in this report, leads me to conclude that the Prolene polypropylene in TVT does not degrade or if it did, that it has a clinically insignificant effect. Prolene polypropylene has been studied more than any other material for use as a sling and the safety and efficacy of the TVT is supported by extensive clinical data.

A claim has been made by plaintiffs' experts suggesting a possible association between synthetic mid-urethral slings and malignant transformation based on rodent studies where sarcoma formation was reported after implantation of sheets of polypropylene. After reviewing available

medical literature, it is my opinion that this claim lacks scientific validity. Despite the widespread use of synthetic mesh in surgical procedures in humans over the past 50 years, there have been few reports of malignancy formation after implantation with prosthetic materials. These concerns have recently been addressed by Moalli et al and it was concluded that polypropylene, which has been used extensively in humans for over five decades, is not associated with carcinogenesis. (Moalli et al, 2014). As stated in the AUGS/SUFU Frequently asked questions by providers, mid-urethral slings for stress urinary incontinence: "There is no compelling evidence supporting human malignant transformation related to polypropylene despite the millions of individuals implanted with various forms of this material spanning well over a half century world-wide." (AUGS-SUFU FAQs by Patients on Mid-urethral Slings for SUI March 2014). Type 1 macroporous, monofilament polypropylene has been found to be the most biocompatible biomaterial for use in the pelvic floor (Ford, 2015).

It is my understanding that there has been a claim that the particles from the mechanically cut mesh can lead to complications like pain and erosion. This is speculation and without reliable scientific support. In my searches and review of the clinical literature, and my attendance at specialty meetings and conferences, this is not a concern and particle loss has not been identified by any reliable scientific clinical studies as a cause of complications. The material in any particles would be the same polypropylene material used in the mesh. As discussed above, the tolerability and biocompatibility of this material is established. Prolene sutures are also used in much larger quantities in other surgeries and surgeons for decades have hand cut mesh in the operating room. The long term clinical studies on TVT which show its efficacy, durability and safety have used mechanically cut mesh and the literature from before and after 2007 when laser cut mesh became available do not demonstrate a difference in clinical effect based on whether the mesh is cut

mechanically or with a laser. Both behave the same under physiologic conditions. Either can have particle loss and rope under misuse such as removing the sheath and stretching the tape, but that is not how TVT mesh is designed to be placed in women nor is it consistent with the TVT IFU and professional education. The theory that particles from mechanically cut TVT lead to adverse clinical effects in patients is not supported by the medical literature or my clinical experience having placed hundreds of TVTs.

With specific regard to synthetic mid-urethral slings and meshes used in pelvic floor support, there is no reliable scientific evidence to indicate that mesh induces malignancy – and several studies contradict that argument. For example, King et al., 2014 reported on 2,361 patients who underwent synthetic sling placement, and found one case each of bladder and vaginal cancer for an incidence of 0.08%, with mean follow up of 42 months. Linder, 2010 discovered only two cases amongst 2,474 who underwent polypropylene mid-urethral sling placement (0.08%) with a mean follow up of 61.5 months. There is also no epidemiologic data that shows a statistically significant increased rate and risk of cancer with polypropylene mid-urethral slings and meshes used in pelvic floor support compared to the expected population level data. In fact, the Mayo Clinic group found that no local cancers were detected among the 302 patients (12 % of the cohort) with more than 10 years' follow-up. There is simply no reliable data demonstrating an association between mesh placement with subsequent local cancer formation.

It is also my understanding that some are claiming that the TVT can result in chronic inflammation or infection. However, there is no definitive scientific evidence to support this. The earlier referenced studies do not support these theories and the metaanalyses and systematic reviews show that infection of the mesh is exceedingly rare. I have personally implanted hundreds of TVTs and have seen no mesh infection.

In summary, the polypropylene material used in the TVT is optimal for use in treating SUI on a long term basis. No other surgical treatment for SUI has undergone such extensive investigation. It has been studied in almost every patient type and the highest level of scientific evidence supports its clinical effectiveness and safety. The FDA and numerous organizations have stated that the safety and effectiveness this product is well-established. (AUA Position Statement on the Use of Vaginal Mesh for the Surgical Treatment of Stress Urinary Incontinence Oct. 2013; IUGA Position Statement on Mid-Urethral Slings for Stress Urinary Incontinence July 2014; FDA Considerations about surgical mesh for SUI 2013; AUGS-SUFU Statement 2014).

III. OPINIONS REGARDING MRS. BAILEY

Mrs. Bailey is a 48-year-old gravida 2, para 1 female who was 33-years-old on April 19, 2001 when Dr. David Perlow, a board-certified urologist, implanted a TVT to treat her diagnosed stress urinary incontinence.

Mrs. Bailey's past medical and surgical histories prior to the TVT mesh implants include: gallbladder removal (date unknown); obesity; hypertension. Mrs. Bailey also underwent collagen bulking agent injections at some point after her TVT implant (date uncertain).

Mrs. Bailey had a TVT sling for stress urinary incontinence on **4/19/01** by Dr. David Perlow. Her EBL was 50cc and there were no complications. In his operative report, Dr. Perlow dictated, "the vaginal tape was pulled taut so that it would suspend the urethra."

On 5/28/02, Mrs. Bailey was seen by Dr. Reker for complaints of obesity. She was reporting failing multiple diets and OTC medications. She found it difficult to exercise secondary to chronic foot, knee and back pain. She was also still complaining of incontinence despite her TVT. She was requesting to be referred for gastric bypass surgery. She weighed 227 lbs. and had

a BMI of 41. She was diagnosed with morbid obesity. She was prescribed Meridian and referred for consultation for gastric bypass surgery.

On 5/1/03, Mrs. Bailey was seen by Dr. Kate Osterloh for follow up on obesity. She was unhappy with her weight and was unable to exercise because of foot pain. She had failed Meridian secondary to headaches and Xenical secondary to severe diarrhea. She complained of worsening urinary incontinence. She reported incontinence all the time. She failed the TVT and a collagen injection. She had symptoms of plantar fasciitis and did not keep her podiatry appointment. She also had a lump on the left foot that was painful. On physical exam, she weighed 239 lbs. and her BMI was 41. Her doctor's plan was to advocate for gastric bypass since she had failed conservative therapy. She was referred to podiatry and urology.

On 10/13/03, Mrs. Bailey saw Dr. Osterloh and reported that a side effect of her hypertension medication had been increased urination. Mrs. Bailey complained of worsening anxiety over the last several years. It was noted that Mrs. Bailey "often overreacts to situations, is tearful, always feels tense and has poor sleep because her mind is racing at night."

On 12/3/04, Mrs. Bailey was seen by Dr. Sward with a chief complaint of a burning sensation during urination. She reported urinary frequency, suprapubic pain and hematuria. She reported chronic incontinence and dyspareunia. On physical examination, she weighed 239.6 lbs. She had suprapubic tenderness with palpation. She was diagnosed with a UTI and referred to Dr. Harbin (urology) for further evaluation.

On 12/10/04, Mrs. Bailey was seen by Dr. Schrum (urology). He reported that Mrs. Bailey had complex urinary incontinence at baseline and that her incontinence has worsened after TVT and collagen injections. She was reporting constant leakage and painful intercourse. He referred her to Emory urogynecology.

On 2/10/05, Mrs. Bailey was seen by Dr. Rony Adam, a urogynecologist at Emory. Mrs. Bailey reported a surgical history of a cystocele repair and mesh sling in 1999 and collagen injection in 2000. She reported leaking with standing and bending. She denied leakage with coughing or sneezing. She reported leakage without sensation. She reported frequency and denied urgency. She reported difficulty initiating her urine stream, slow urine stream and incomplete bladder emptying. She reported nocturia 2-3/night and required protective garments. She reported difficulty with intercourse because her partner was feeling something inside the vagina. She had tried and failed Ditropan and Detrol. She reported hematuria and but denied dysuria or vaginal bleeding. On physical examination, her height was 5'3", weight 244.5 lbs. On pelvic exam, her vagina was noted to be scarred anteriorly, there was no discharge but an odor was noted. There was mesh exposure noted at the midurethra on the right side that was tender to palpation and a cystocele was noted. She had apical descent and a mild rectocele. Her levator ani were normal. Uterus, cervix and adnexa were normal. She had simple uroflowmetry that showed complete emptying but it was not diagnostic due to low bladder volume (voided 95cc, PVR 12cc). Dr. Adam's assessment was vaginal mesh erosion (exposure) with history of hematuria, dyspareunia, SUI vs. OAB, possible sensory abnormality with feeling of fullness and small bladder capacity. No evidence of overflow incontinence. The plan was to obtain her operative reports for review, bladder diary, urodynamic testing, possible cystoscopy and EUA to rule out urethral erosion. She was to follow-up after her urodynamic testing was completed.

On 3/30/05, Mrs. Bailey had a urinalysis that was negative for blood. Dysuria was reported as absent as well. She was complaining of constant urinary leakage, leakage with standing and bending and denied leakage with cough or sneeze. She reported urinary urgency, frequency and urge incontinence. She reported nocturia 2-3/night and incontinence without sensation. She also

had "severe difficulty emptying her bladder." On exam, she was noted to have a "fixed urethra" and midurethral mesh erosion (exposure). Her bladder diary showed an average volume of 140 ml and frequency of 15-17 voids daily. On simple uroflow she voided 137 cc, peak flow 13.9 ml/sec and average flow was 8.6 ml/sec, PVR 85 ml. Pattern was described as "straining" and her flow time was 15.8 sec. On simple cystometry, her bladder capacity was 415 ml and detrusor overactivity was noted. It was noted that "compliance borderline with 49cm H20." VLPP were negative. On complex cystometry, she voided 156 ml with a PVR of 246 ml. Her Qmax was 7.6 ml/s, Pdet at Q max:70 cm H20 and max Pdet: 80 cm H20. Voiding mechanism was described as "normal with Valsalva assistance" and the pattern was described as "prolonged/attenuated." Urodynamic findings were described as "normal bladder sensation, capacity and borderline compliance. Detrusor instability was noted. No urodynamic stress incontinence demonstrated. Markedly elevated detrusor contraction with Valsalva assistance, prolonged and attenuated flow noted on pressure flow study consistent with bladder outlet obstruction." The plan was to "take down" (remove or revise) the sling.

On 5/19/05, Mrs. Bailey was seen by Dr. Adam for consultation regarding her UDT. She had been diagnosed with constant urinary leakage and dyspareunia. On physical examination, she had mesh exposure, stage 2 rectocele and a fixed urethra. Sling revision was recommended and Mrs. Bailey was counseled about the risks including failure to relieve her symptoms.

On **6/20/05,** Mrs. Bailey had a partial excision of her TVT for bladder outlet obstruction and vaginal mesh erosion (exposure) by Drs. Rony Adam, and residents Cashbaugh and Ding. Her EBL was 100cc and there were no complications. The findings at the time of that surgery were "TVT mesh located approximately 1 cm proximal to the urethral meatus and causing significant urethral compression. There was no urethral erosion noted on cystoscopy. Relief of urethral

compression noted following mesh removal." The operative report notes that approximately three centimeters of mesh was excised (which was confirmed by the pathology report). Dr. Adam testified that he did not find any evidence that the mesh had roped or curled or shrunk or contracted. Dr. Adam also testified that he has not in 14 years of experience with the TVT found any evidence of roping, curling, shrinking, or contracting.

On 7/14/05, Mrs. Bailey was seen for a 4 week post op check. She reported painful urges to urinate and reports that she is still leaking occasionally. Postoperatively she was doing CISC for two weeks but it reportedly became too painful for her to continue. She reported constipation and was unsure if she was emptying her bladder completely. On physical examination, she was noted to have adequate urethral mobility, no abnormal discharge and a negative supine stress test. Patient reported feeling like she had a full bladder and voided only 63 cc, PVR 10cc. Patient reported having the urge to urinate even after voiding. Her assessment was urge incontinence and Ditropan was prescribed. She was to follow up in 3 months.

On 8/30/05, Mrs. Bailey was seen by Dr. Osterloh for low back pain. She denied incontinence at that visit.

On 6/28/11, Mrs. Bailey was seen by Dr. Osterloh "to get reestablished." She denied stress incontinence. She reported trouble emptying her bladder since surgery and was concerned about her sling because of a "recall." She weighed 240.8 lb and had a BMI or 42.7. Her assessment was insomnia, HTN, GERD, Obesity, lumbago, bipolar disorder. She was instructed to continue medications, modify her lifestyle and lose weight. She was asked to follow up in six months or as needed.

In 2014, Mrs. Bailey experienced an elbow injury and received frequent medical treatment and physical therapy.

On 4/25/14, Mrs. Bailey was seen at Cartersville Family Medicine. The record notes: "has Transvaginal Mesh Implant—didn't help bladder leakage—painful with intercourse, hurts husband as well. Bladder was still leaking and was sent to Dr. Black—sent to Emory urologist--told has deterioration from the mesh (lawsuit from them contacting) —removed some of the mesh—collagen implant helped the leakage—since then can't urinate normally—getting harder and harder to urinate—not gone back to emory because no insurance. Has to strain to urinate. Sex is not pleasant for either."

1. **Mrs. Bailey had a TVT for stress urinary incontinence in 2001. Her physician documented "pulling the tape taught" instead of placing the tape "tension-free." The records also demonstrate that the tape was likely placed too distally, just 1 cm proximal to the urethral meatus. This placement of the TVT on excessive tension most likely caused urethral outlet obstruction, voiding dysfunction, irritative voiding symptoms and vaginal mesh exposure. Thus, Mrs. Bailey's complications were not due to any inherent flaw with the TVT itself, but due to the technique in which the TVT was placed.**

The TVT is the gold standard surgical operation for correction of female stress incontinence. It has been performed for 30 years with excellent success and minimal risk of complications. As described above, it has a better success rate and has less risk of obstruction than any retropubic culposuspension and is less invasive and performed in a fraction of the time it takes to perform a Burch or MMK.

Voiding dysfunction, both short and long term, is one of the most common complications of traditional anti-incontinence procedures in women, with some authors reporting an incidence as high as 25%. (Parnell, 1984; Galloway, 1987; Lose, 1987; Eriksen, 1990). In the SISTEr trial voiding dysfunction was reported in 14% of women undergoing the pubovaginal sling with six percent requiring surgical revision for persistent voiding dysfunction. (Albo, 2007). In a prospective long term follow up study in women with recurrent stress urinary incontinence followed for a mean of four years, 91% of patients remained cured or significantly improved, with

no significant complications or long term postoperative voiding problems reported. (Rezapour & Ulmsten, 2001). ACOG and AUGS conducted a systematic review of the medical literature and issued Practice Bulletin No. 155 Urinary incontinence in women (American College of Obstetricians and Gynecologists. Obstet Gynecol 2015; 126:e66–81). This review (based on Level A evidence) found that voiding dysfunction is more common with open colposuspension than with synthetic midurethral slings. The Cochrane review (2011) also found that minimally invasive synthetic suburethral sling operations, and in particular the TVT, have less postoperative voiding dysfunction and de novo urgency symptoms than traditional urethral suspension procedures.

The TVTs design also allows for resolution of voiding dysfunction when it occurs with a minor outpatient procedure, whereas resolving voiding dyfunction after a Burch or MMK requires invasive and difficult procedures (urethrolysis) and inpatient hospitalization.

The TVT (tension-free vaginal tape) is designed to be placed at the level of the mid-urethra without tension. In this case, unfortunately, the TVT was placed at the distal urethra on excessive tension. This led to urethral outlet obstruction, voiding dysfunction, irritative voiding symptoms (urgency, frequency and incontinence) and mesh exposure. This was not due to an inherent flaw in the design of the TVT. Although Mrs. Bailey's voiding dysfunction and exposure were not caused by a flaw in design of the TVT but to implant technique, these symptoms were resolved with a minor one hour vaginal mesh excision that did not compromise her urinary continence. It is also notable that Dr. Perlow testified he was aware of the risk of urinary retention, and it was a potential complication he would have discussed with Mrs. Bailey (which is specifically referenced in Mrs. Bailey's records).

Dr. Perlow testified that he had a higher rate of post-op retention than what is generally reported in the literature (10-20% vs 2-5%) indicating that he was not using optimal technique. The use of a spacer does not prevent excessive tensioning unfortunately because the sling can be placed or pulled tightly against the spacer and when the spacer is removed, the sling will remain on excessive tension. The use of a spacer is standard. If preventing over-tensioning of a sling was as simple as using a spacer, post operative voiding dysfunction would be easier to prevent. Instead, it is a common diagnostic and therapeutic dilemma that has led to the advent of "adjustable" slings and many studies to try to figure out the optimal way to diagnose and treat post-op voiding dysfunction. Over-tensioning a sling leading to post operative voiding dysfunction is a well-known phenomena. It has led to criteria being defined to help to identify post-urethral suspension obstructive voiding, studies being done to determine the optimal time to revise or cut a sling in a patient when obstruction is suspected, and attempts to create slings that can be adjusted in the immediate post operative period.

Based on my knowledge, experience, review of the medical literature, and my attendance at professional meetings, it is also not uncommon for patients who have obstructive voiding due to a sling that was placed with excessive tension to develop worsening symptoms over time. Obstructive voiding is not always obvious and patient presentation is variable. Some patients may report a normal urine stream but report irritative voiding symptoms. Others may report a slow urine stream and have recurrent UTIs but deny urinary urgency and frequency. These symptoms may be delayed in presentation. The bladder has the capacity to overcome obstructed voiding initially, and patients may be minimally symptomatic or asymptomatic early in the course of obstruction. But as the obstruction persists, the bladder muscle becomes hypertrophied, impairing bladder compliance and function. This leads to a progression in symptoms and patients may report

worsened symptoms over time or new symptoms months or years after the initial obstruction. This delayed presentation of symptoms does not occur because the obstruction is new, or has progressed or changed with time, but occurs because the bladder's work to overcome the obstruction progressively changes the bladder muscle overtime and leads to compromised bladder function. Studies evaluating the timing of sling revision report improved outcomes with earlier sling revision as opposed to later sling revision. (Leng WW, Davies BJ, Tarin T, Sweeney DD, Chancellor MB. Delayed treatment of bladder outlet obstruction after sling surgery: association with irreversible bladder dysfunction. J Urol. 2004;172:1379–81; South MMT, Wu JM, Webster GD, Weidner AC, Roelands JJ, Amundsen CL. Early vs late midline sling lysis results in greater improvement in lower urinary tract symptoms. Am J Obstet Gynecol. 2009;200:564.e1–e5). This is a well-described phenomena and does not result from contraction of the sling over time.

Contraction of tension free non-anchored mesh has not been seen in my practice or been reported in the literature. Dr. Adam testifies to the same. Contraction describes a phenomena of shrinkage. Mesh shrinkage may lead to the clinical syndrome of mesh contraction causing pain or other pathology, but this is seen when a portion of the implanted mesh is anchored or sutured to something fixed like bone, ligaments or the like, and then the tissue incorporating other parts of the mesh (namely the body of the mesh) shrink around the mesh, placing tension on the parts of the mesh that are fixed. This does not occur with the TVT or any other MUS because they are "tension-free", i.e. unanchored. In the event that a midurethral sling were to shrink, the sling should decrease in size uniformly without causing tension as the tissue around the sling grows into it over time. There is no static force to "pull" or cause tension if the sling is not anchored to something that is fixed. Thus, any shrinkage of a tension free sling should decrease the overall size of the sling as opposed to compressing the urethra.

2. **If Mrs. Bailey had urethral obstruction after her TVT she should not have had collagen bulking agent injections as this would only exacerbated her outlet obstruction and voiding dysfunction and lead to worsened overactive bladder symptoms.**

Urethral bulking is a treatment for stress incontinence usually reserved for patients who have failed slings or who are not sling candidates. Urethral bulking increases urethral bulk and works to improve stress incontinence by narrowing the urethral caliber. It is indicated for patients who have intrinsic urethral deficiency and impaired mobility of the bladder neck, and is contraindicated in the setting of active UTI, high residual urine (voiding dysfunction), severe detrusor overactivity, and reduced bladder capacity (less than 250ml). (Bent,A, Cundiff, G and Swift, S., Ostergard's Urogynecology and Pelvic floor dysfunction. 6th ed.p263-273.) Patients who have voiding dysfunction should not have urethral bulking as it can make their voiding dysfunction worse. The most common complications in the immediate period after urethral bulking is urinary retention and voiding dysfunction. Voiding discomfort occurs in some patients and the incidence of UTI is as high as 10-15%. (Bent). It is unclear from Mrs. Bailey's record if she had any evaluation of her voiding prior to her collagen bulking agent injections or when her voiding dysfunction began (she believed the voiding dysfunction began "maybe six months to a year" after her TVT), but it is likely that if she had voiding dysfunction after her TVT that the collagen bulking agent injections made it worse.

3. **Mrs. Bailey suffered a vaginal mesh exposure and dyspareunia after her TVT. These are known potential complications with mid-urethral slings. When midurethral slings are placed appropriately, the risks of these complications are low. Mesh exposure after a midurethral sling is amenable to treatment with a minor outpatient procedure. Mrs. Bailey's TVT sling excision was minimally invasive and was performed in one hour without complication.**

Mrs. Bailey suffered vaginal mesh exposure after her TVT that may have caused dyspareunia. The mesh exposure itself caused only minor symptoms otherwise as evidenced by

Mrs. Bailey describing that she had pain "only during intercourse" on her pre-operative Nursing Admission Assessment form. Dr. Adam also documented that she denied vaginal bleeding, dysuria or pelvic pain. Dr. Adam communicated this when writing his consultation note to Dr. Schrum, "I did note erosion on my examination today. She does not seem to be significantly symptomatic from this as she denies any vaginal bleeding or significant pain however she was told that she had microscopic hematuria." Mrs. Bailey also specifically testified that she did not have pelvic pain following her TVT implant.

Mrs. Bailey was taken to the operating room for a partial excision of her TVT to resolve her mesh exposure, outlet obstruction and dyspareunia. This procedure was performed in approximately one hour with an EBL of 100cc. Mesh exposure is a known potential risk with mesh augmentation and does not indicate any defect in sling design. In fact, despite the partial excision of the sling, Mrs. Bailey continues to be free from the stress incontinence the TVT was placed to correct.

4. **Mrs. Bailey may still have overactive bladder symptoms. This is common after prolonged bladder outlet obstruction. These symptoms are treatable with physical therapy, medications, Interstim or Botox injections. If Mrs. Bailey's bladder outlet obstruction caused her overactive bladder symptoms, this is not due to any defect in TVT design, but to the implant technique. In any event, this condition is treatable with minimally invasive therapy.**

I do not have any records documenting Mrs. Bailey's urinary symptoms prior to the placement of her TVT sling. Dr. Schrum indicated that "she had complex urinary incontinence to begin with" suggesting that she may have had mixed symptoms and overactive bladder prior to her TVT placement by Dr. Perlow. Bladder outlet obstruction can cause or worsen overactive bladder symptoms. Based on my knowledge and experience as a female pelvic reconstruction surgeon, as well as the medical literature, my training of other doctors, and my attendance at professional meetings, when a TVT leads to bladder outlet obstruction it is due to suboptimal placement of the

TVT and not to a defect in the design of the TVT. Dr. Perlow describes placing the sling "taught" which is not how it is designed to be placed. This led to obstructive voiding which can cause irritative symptoms (urinary urgency, frequency, urgency incontinence, nocturia and incontinence without sensation). Her contigen injections likely contributed to urethral obstruction as well as voiding dysfunction and urinary retention are common complications of urethral bulking. (Bent). Irritative symptoms may persist after the obstruction resolves, especially if the obstruction has been prolonged. These symptoms are however, amenable to treatment with medications or minor procedures including intravesical Botox injections and sacral neuromodulation. Notably, Mrs. Bailey has not sought medical treatment for these complaints since 2005.

Although Mrs. Bailey's TVT was placed with excessive tension, she also had another incontinence procedure that can cause bladder outlet obstruction. Her bulking agent injections likely would have worsened or contributed to her voiding dysfunction. This also likely contributes to why she continues to report voiding dysfunction despite revision of her TVT. She also may feel that she has voiding dysfunction because she constantly has to go to the bathroom. This is supported by the fact that even after she empties her bladder well after Dr. Adam's surgery, she still feels like she needs to urinate and senses incomplete bladder emptying. This is not true voiding dysfunction, but an incorrect interpretation of urinary urgency. Dr. Adam's normal voiding study after his excision surgery demonstrates that the TVT mesh is no longer obstructing Mrs. Bailey's urine flow.

5. Dr. Adam noted vaginal scarring which is a known risk of any surgical procedure to treat stress incontinence.

Prior to performing his revision procedure in 2005, Dr. Adam noted that Mrs. Bailey had some anterior vaginal scarring on examination. Scarring is a known risk of any surgical procedure to treat stress incontinence, and would have been a risk of any alternative surgical procedure Dr.

Perlow could have performed (non-mesh procedures would actually have required larger incisions). The data cited above demonstrates the safety and effectiveness of the TVT. Also, there is some indication that Mrs. Bailey had an anterior repair for a cystocele in the past as well. If so, this likely would have led to scarring along the anterior vaginal wall as well.

6. Mrs. Bailey's Dyspareunia Is Most Likely Not Caused By Her TVT As She Described That Her Dyspareunia Was The Same In Severity And Location As Prior To Dr. Adam's Revision Procedure.

Dyspareunia is a very common complaint at baseline in women in general. It is often multifactorial, involving vaginal atrophy, decreased libido, muscular pain or spasm, partner issues, and many other causes. Dietz and Maher noted that up to 64% of sexually active women attending a urogynecology clinic suffer from female sexual dysfunction. (Dietz V, Maher C. Pelvic organ prolapse and sexual function. Int Urogynecol J. 2013 Nov;24(11):1853-7.).

Dyspareunia/vaginal pain with TVT is rare and less than that seen with Burch and fascial sling (Schimpf et al, 2014; AUA Updated SUI Guidelines 2012). Zyczynski et al reporting on the planned secondary analysis on TOMUS trial on sexual activity and function two years after MUS surgery (including TVT) found that pain with sexual intercourse decreased from 38% at baseline to 27%. In other words, overall sexual function improved significantly following implant of a mid-urethral sling. In my experience, I have not seen a TVT cause dyspareunia in the absence of a mesh exposure.

If Mrs. Bailey does have dyspareunia, then it is most likely not caused by her TVT mesh. Mrs. Bailey testified that the severity and location of her pain with intercourse did not change with Dr. Adam's revision procedure and mesh removal. She specifically stated that her dyspareunia was the same severity and location as prior to the revision surgery. If Mrs. Bailey's dyspareunia was being caused by her TVT mesh, then I would expect, based on my knowledge, experience,

review of the medical literature, my training of other doctors, and my attendance at professional meetings, that her dyspareunia would have improved when the mesh was removed by Dr. Adam. However, based on Mrs. Bailey's testimony, the revision procedure by Dr. Adam had no impact on either the location or the severity of her discomfort with intercourse. Therefore, it would be speculative to state that her dyspareunia was (or is) being caused by the TVT mesh.

While Dr. Walmsley noted a tender area of induration upon palpation in Mrs. Bailey's right peri-urethral area, it is unlikely that he was feeling residual mesh because Dr. Adam removed the TVT mesh from that area. Dr. Adam's operative report, which was confirmed by the pathology report, describes that three centimeters of mesh was removed bilaterally from the urethra. This would encompass the area of peri-urethral tenderness and induration referenced in Dr. Walmsley's examination of Mrs. Bailey. Dr. Walmsley even acknowledged he was unsure whether Mrs. Bailey had any remaining mesh in that area.

It is also notable that Mr. Bailey's testimony is inconsistent Ms. Bailey's allegations regarding her dyspareunia. Mrs. Bailey's description of her dyspareunia in her deposition was also inconsistent with what one would expect if the TVT mesh was the cause of her complaints. Mrs. Bailey testified that she feels pain during intercourse "when he was all the way in." Based on my knowledge, experience, review of the medical literature, my training of other doctors, and my attendance at professional meetings, this description is not consistent with dyspareunia caused by a TVT – which would be expected to be described as discomfort with entry, not discomfort with deep penetration. Given the lack of medical records documenting Mrs. Bailey's dyspareunia complaints, the absence of objective findings related to the cause of her dyspareunia, and the factors discussed above, it is my opinion that it would be speculative to state that Mrs. Bailey's TVT mesh caused her alleged dyspareunia. There are numerous possible causes of Mrs. Bailey's

dyspareunia, but it was not likely caused by her TVT mesh or any inherent flaw in the design of the TVT.

7. It Is Unlikely That Mrs. Bailey Will Suffer Any Further Complications From Her TVT.

It would be speculative to suggest that Mrs. Bailey will suffer any further complications from her TVT mesh – the vast majority of which was removed from her suburetral area by Dr. Adam. Since the surgery by Dr. Adam, there is no evidence of further mesh exposure or complications caused by the TVT mesh itself. It is my opinion that further surgery to remove the remaining TVT mesh would be unnecessary and would subject Mrs. Bailey to all the typical risks of pelvic surgery. Her overactive bladder symptoms as previously stated may be effectively treated with medications, Interstim or botox therapy. Her voiding dysfunction has most likely resolved as evidenced by the normal voiding study done by Dr. Adam after her sling revision. She is sensing voiding dysfunction most likely because of overactive bladder symptoms and urgency. Again, these symptoms are amenable to treatment. Mrs. Bailey has required very little medical treatment for her alleged gynecological complaints in the last 10 years, and there is no way to state with any degree of medical certainty that she will require more frequent treatment in the future.

IV. OPINIONS REGARDING RISK INFORMATION AND PROFESSIONAL EDUCATION

Based on my knowledge and experience as a female pelvic reconstruction surgeon, as well as the medical literature, my training of other doctors, and my attendance at professional meetings, it is my opinion that the risks associated with the TVT were adequately described in the TVT IFU and professional education materials. While those materials are important, there are many other ways that physicians in this field obtain information about the surgical procedures they perform. My colleagues and I do not rely on IFUs or instructions from device manufacturers as

our primary means of learning about the products used in surgery, the methods of using or implanting surgical prosthetics, or risks associated with their use.

Rather, we learn how to perform any surgery, including TVT as previously stated, in residency, fellowship and by proctorship, and it is fully expected that surgeons would be familiar with them as part of meeting their standard of care. ABOG and ABU Guidelines for Learning in Female Pelvic Medicine & Reconstructive Surgery; AUGS Resident Learning Objectives. We learn about the risks and benefits of procedures primarily from published research and clinical experience, but also from CME and dialogue with colleagues. Following the standard of care also requires that surgeons continue their education by reviewing medical literature so that they can continue to be updated on trends relevant to the products and procedures they utilize.

Any surgical procedure in the pelvic area carries risks, and procedures involving polypropylene mesh are commonly known to have risks. However, for the most part, the risks associated with the TVT procedure are common to all pelvic surgeries including non-mesh surgeries. It is the responsibility of a surgeon to understand the inherent risks of the surgical procedures they perform on their patients.

These opinions, as well as the opinions offered in this report, are based on my extensive experience in treating stress urinary incontinence with TVT, my training of other physicians in the proper use of mesh devices, my attendance at professional meetings, and my review of extensive medical literature relating to stress urinary incontinence and the types of claims Mrs. Bailey is asserting. Accordingly, I am qualified to offer opinions as to the adequacy of information provided by Ethicon from the perspective of the physician user. I am also qualified to offer opinions about what was commonly known and understood in the medical and scientific communities, especially by pelvic surgeons, regarding the risks of mesh and non-mesh surgical

procedures. It is commonly known that any surgery for stress urinary incontinence can potentially cause complications including, among other things: dyspareunia, pain, new or worsened incontinence, voiding problems, and the need for further surgeries. It is also commonly known that these complications can be temporary or long-term, or mild, moderate, or severe. These risks are present regardless whether mesh is utilized by the surgeon given the surgical techniques involved in the procedure.

The TVT IFU warned of several risks including infection potentiation, inflammation, temporary or permanent lower urinary tract obstruction, fistula formation, erosion, and extrusion. It is understood in the medical and scientific communities that these complications may cause pain, voiding problems, and dyspareunia, as well as the need to reoperate.

While I am not a regulatory expert and do not intend to offer regulatory opinions, in forming these opinions, I have reviewed and considered 21 C.F.R. 801.109(c), Ethicon's standard operating procedure on labeling, and the "Blue Book Memo" from FDA. 21 C.F.R. 801.109(c) states that risk information for devices used by licensed professionals may be omitted from product labeling if "the article is a device for which directions, hazards, warnings, and other information are commonly known to practitioners licensed by law to use the device." These materials further support my opinions.

With respect to professional education, it is not a device manufacturer's responsibility to train surgeons, but it is a positive thing for them to offer supplemental surgical exposure to "experts" in the fields in which they offer devices, because it allows surgeons, including myself, exposure to continuing medical education from those that have the most experience with their products. Learning and improving is a process for surgeons that is never complete. This is why continuing medical education is not just encouraged, but required to maintain board certification

and medical licensure. It is from high volume surgeons with great expertise that lower volume or less experienced surgeons become better surgeons. Every patient in the country cannot go to one or two high volume surgeons in specialty centers to have their prolapse fixed or their incontinence treated. Every surgeon should be given the opportunity to improve their surgical skills. The training that Ethicon offered, offers or supports should supplement the surgeon's training from residency, fellowship and proctorships, and should not be the surgeon's primary source of surgical expertise. I have knowledge of the training offered by many other manufacturers, and the professional education offered by Ethicon has been exceptional in my opinion.

V. FEES

I am serving as a paid expert consultant to Troutman and Sanders regarding the matters of this case. My fees are billed at $400 per hour for consulting/case discussion/telephone conferences, $400 per hour for case review, $600 per hour for video testimony, and $5,000 per day for deposition/trial testimony. In the last four years, I have testified as a retained expert both by deposition and at trial in Hammons v. Ethicon in the Court of Common Pleas for Philadelphia County, Pennsylvania, No. 3913. I have also testified by deposition in Stubblefield v. Ethicon in the United States District Court for the Southern District of West Virginia, Case No. 2:12-cv-00842.

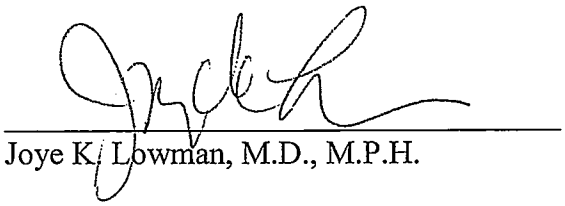
VI. CONCLUSION

The TVT revolutionized the treatment of female stress urinary incontinence worldwide. It is the most extensively studied anti-incontinence procedure in history. It is the treatment of choice in patients with severe SUI (ISD), and is effective in treating primary and recurrent incontinence. Multiple systematic reviews, meta-analyses and randomized, controlled trials have been published comparing the TVT to other SUI procedures, and all have consistently concluded that the TVT has

the highest levels of patient satisfaction, the highest cure rates and demonstrates superior safety and efficacy when compared to various alternatives. No other surgical treatment for SUI has been studied more.

There is consensus from numerous medical societies and professional organizations that polypropylene mid-urethral slings are the treatment of choice for female SUI, including the American College of Obstetricians and Gynecologists, American Urogynecologic Society, Society of Gynecologic Surgeons, American Urological Association, Society of Urodynamics, Female Pelvic Medicine & Urogenital Reconstruction and the International Urogynecology Association, using the TVT as "the gold standard". As such, it is my opinion that the TVT is not defective in design or unreasonably dangerous for its intended use. No other procedure is more effective or better tolerated. The TVT professional education materials are adequate to describe the procedure and its potential complications. Furthermore, surgeons do not rely on these materials alone, but are aware of potential risks and benefits of offering the TVT family of products from our training, education and experience. The TVT is the most effective surgical treatment for female SUI and it is the most widely used and studied mid-urethral sling worldwide. It is considered the "gold standard" against which all new procedures are compared, and is my procedure of choice for treatment of SUI in my patients.

The opinions reflected in this report are based on information currently available to me. I reserve the right to modify or amend these opinions as new information becomes available.



Joye K. Lowman, M.D., M.P.H.